


Original Article

The analysis of the results of the Olympic free-style wrestling champions

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ABSTRACT

The successful and effective management of sports training is impossible without the justified forecasting. The retrospective analysis of the sport career of elite sportsmen allows to identify interconnections of the competitions – results on various stages of the sporting career. Analysis of papers showed, there are no researches which would analyse the highest-level sportsmen in wrestling – Olympic champions. Aim of the research – to analyse results of the Olympic champions in wrestling from 1996 to the present day and to discover the main trends and regularities. The analysis included 41 sport careers of winners in freestyle wrestling of the six Olympic Games from 1996 to 2016. The results of wrestlers on international competitions into the four age stages are analysed: the pre-junior age, junior age, senior until the victory at the Olympic Games and a time period after the victory. The majority of the sportsmen (90,3 %) win only once and participate in the OG only once or twice (90,2 %). The retrospective analysis has shown that 48,8 % of wrestlers-champions have performed at the international stage at the cadets age, and 85,4 % of sportsmen at the junior age, over 90 % of them have taken the winning places. Prior to the victory at the Olympic Games 87,8 % of the sportsmen take part at the continental championships, all of them have won medals. And 82,9 % have participated at the world championships, and 91,2 % of them have taken places from 1 to 3.

Keywords: Olympic champions; Wrestling; Retrospective analysis; International competitions.

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INTRODUCTION

The successful and effective management of sports training is impossible without the justified forecasting, which is adequate to the modern scientific knowledge. The forecasting creates the necessary preconditions for acceptance of correct management decisions by sportsmen, trainers, administration, etc (Abernethy 2008). The forecasting is directed at the designing, planning and, eventually, achieving of the achieving promising goals (Shynkaruk, 2011; Platonov, 2015). The setting of a definite promising goal is always connected to the forecasting of sport results (Shelepen, 2009; Bruce, 2013). The main high-priority aim of training of high qualification sportsmen is the success at the Olympic Games (OG). The discovery of talented sportsmen and the ways of their improvement is one of the most discussed and popular directions in the training of athletes (Vaeyens, 2009; Gulbin, 2013; Issurin, 2017).

The retrospective analysis of the sport career of elite sportsmen allows to identify interconnections of the competitions – results on various stages of the sporting career and is one of the main methods in the sporting forecasting (Latyshev N., 2014). The given analysis confirms (Gulbin, 2010; De Bosscher, 2015) the necessity of reaching a certain result as a junior (or a pre-junior) for the success as an adult sportsman at the international level. The reverse (perspective) approach is also used when the career of elite juniors and their following career as adults is considered (Julio, 2009; Brouwers, 2012). The significance of success as a junior at the adult level competitions (Li, 2018) is also underlined.

In general, the analysis of the competition performances is given a great significance: the analysis is conducted for sportsmen of various ranks – from a candidate in national squads (Güllich, 2014) to the Olympic Games champions (García-Pallarés, 2011; Huxley, 2017). The analysis is also conducted for various Olympic sports: athletics (Hollings, 2010, 2014), swimming (Stanula, 2012), cycling (Schumacher, 2006), sport games (Meylan, 2010; Güllich 2014), tennis (Reid, 2006).

Similar researches of the elite sportsmen career are conducted in wrestling and martial arts (Tarakanov, 2013; Latyshev M., 2016). The studies are conducted in judo (Julio, 2009; Barreiros, 2012), taekwondo (Li, 2018), Greco-Roman wrestling (Korobeynikov, 2009; Tropin, 2013; Baic 2014; Karninčić, 2017), free-style wrestling (Podlivaev, 2005, Latyshev, S., 2009). Nevertheless, in the mentioned papers there are no researches which would analyse the highest-level sportsmen in wrestling – Olympic champions. There are also no researches which would characterize the development of wrestlers (the age of the international career start; the attainment of the pre-junior and junior stages; top result at continental and world level, etc.) in the recent years.

Aim of the research

To analyse results of the Olympic champions in wrestling from 1996 to the present day and to discover the main trends and regularities.

MATERIALS AND METHODS

The sport careers of all the winners in freestyle wrestling of the six Olympic Games from 1996 to 2016 including have been studied. Forty-one international sporting biography have been analysed; they include 828 sportsmen results at the competitions of the international level. The data of the results is taken from the official site of the “United World Wrestling” (unitedworldwrestling.org). The data of a wrestler includes date of birth; country which this sportsman represents; trainer. The following data concerning performances on the international stage is included: the date and the name of competitions; country which this sportsman

represents; taken place. We underline that during the analysed period of time there are sportsmen who have been deprived of golden Olympic prizes for doping. These prizes have not been considered in the analysis. All the data has been combined into one data frame.

The following standard methods have been used in the paper: analysis of research and methodological literature and Internet sources, analysis of the official reports of the competitions, methods of the mathematical statistics; analysis, synthesis and modelling of certain aspects of the competitive activities of the wrestlers.

The wrestlers have been united into three groups depending on the weight categories: light (less than 66 kg), middle (from 66 kg to 89 kg including) and heavy (over 89 kg) for the analysis.

The rating of the “United World Wrestling” (unitedworldwrestling.org, 2018) has been chosen as a basis for the estimation of quality of the sportsmen’s results at the international stage. It is completed by the authors and in this work represents the allocation of a certain number of scores to a wrestler for each result at the international stage depending on the taken place and the level of the competitions (Olympic Games, World Championship, and Continental Championship). One point is scored for the participation in other international competitions regardless of the taken place.

The programming language R (program RStudio version 1.1.477) has been used for the analysis, statistical processing and composition of charts.

RESULTS AND DISCUSSIONS

The geographical analysis has shown the following results. The Olympic Games champions have been representatives of the three continents: Europe – 27 (60,0 %), America – 11 (24,4 %) and Asia – 7 (15,6 %) gold medals. The allocation of the Olympic Games champions is like that. The leaders in quantity of the gold Olympic prizes are sportsmen from the Russian Federation – 17 (37,8 %) prizes and the United States of America – 9 (20,0 %) prizes. Three medals (6,7 %) have been won by the representatives of Turkey, Iran and Azerbaijan. Two gold prizes (4,4 %) are taken by the representatives of Uzbekistan and Georgia. The Democratic People's Republic of Korea, Bulgaria, Canada, Ukraine, Cuba and Japan has one gold medal (2,2 %) each at the Olympic Games.

During the analysed period (1996 – 2016) forty-one wrestlers have become the winners at the Olympic Games and forty-five sets of prizes have been played off; out of them 37 (90,3 %) wrestlers have won a gold medal once, three wrestlers (7,3 %) have won twice and only one wrestler (2,4 %) has won three times. Furthermore, 18 wrestlers (43,9 %) have participated at the Olympic Games once, 19 wrestlers (46,3 %) – two times, two sportsmen (4,9 %) – three times and also two sportsmen (4,9 %) – four times.

The next part of the paper is dedicated to the analysis of the parameters of the Olympic champions in retrospective. Table 1 demonstrates the age data of the sportsmen at the time of their winning the Olympic prize. These are the average readings of the wrestlers from 1996 to 2016. They are necessary for justifying plans of the sporting activities of the wrestlers in perspective.

This data includes: the quantity of the OG winners, the average age of the international career start (the first participation in an international competition), the average age of the winner, the duration of the career from

its start to the victory at the Olympic Games, as well as the general duration of the sporting career (at the international level).

Table 1. Indicators of the Olympic Champions on the weight category and retrospective analysis

Indicators	Olympic Games						Weight Categories		
	1996	2000	2004	2008	2012	2016	Light	Middle	Heavy
Quantity of the champions	10	8	7	7	7	6	15	17	13
Average age of the international career start, year	19.4	17.8	17.8	18.5	19.0	17.2	18.6	17.7	18,8
Average age of the OG winners, year	26.6	25.7	25.1	25.8	25.5	23.2	25.4	25.6	25,4
Time period from the start of the career to the victory at the OG, year	7.2	7.9	7.3	7.3	6.5	6.0	6.8	7.9	6,6

The quantity of the played-off sets of medals has lowered from 10 to 6 resulting from the changes of the competition rules during the considered time. Comparing the years of the age of the career start it is possible to trace a certain tendency towards its decrease: from 19,4 to 17,2 years. The linear regression coefficient is negative and equals to 0,19 year per the Olympic cycle.

A similar picture can be seen and for some other characteristics. Thus, the average age of the winners at the Olympic Games lowers from 26,6 to 23,2 years. The linear regression coefficient is more prominent and equals to $-0,48$ year per the Olympic cycle. Nevertheless, two quite young sportsmen, the age of which has influenced the average number, have become the champions at the last Olympic Games. If to disregard the results of the Olympiad of 2016, then the given coefficient is more than two times less and equals to $-0,22$ year per the Olympic cycle, but even in this case it is still negative. During the considered time only one wrestler has been younger than 20 years at the time of the competition, but in the year of the Olympic Games he has turned twenty.

Considering the issue of the career end, the average age of the career end during the considered time has not practically changed and equals to 29,8 years (the data for 31 sportsmen). We will note, that out of 41 wrestlers - winners of the Olympic Games only 10 sportsmen have participated in the competitions of 2017 and 2018 at least once. This value is rather psychological. From the perspective of physiology, it is of the significant importance that the data which shows that the time interval between the start at the international stage and the time of the achievement of the highest prize (the Olympic gold medal) has noticeably lowered during the last several Olympic cycles.

The analysis of the age characteristics of the champions depending on the weight category is conducted. Second part of Table 1 demonstrates similar figures for the three weight category. It is interesting that the average age of the international career start in the middle-weight group is almost a year less, and the time from the career start to the victory of the Olympic Games – a year more. The average age of the winners does not practically depend on the weight category.

The analysis of the data among the weight categories (Kirk, 2018) has revealed that the average age of the career peak is within the range from 23 to 26 years and demonstrates various tendencies in researches of different authors (Bompa, 1999; Latyshev S., 2009; Baic, 2014; Karninčić, 2017). In our opinion, it is conditioned by the limitation of a selection of sportsmen. The only tendency which is presented in all the researches: the sportsmen of the light-weight group reach the career peak earlier by a year approximately.

The next important characteristic is the quantity of the international level competitions in which the sportsmen have taken part. On the average it equals to 20,2 competitions in the whole sporting career of the wrestler.

It is worth noticing one more important and interesting tendency while analysing each Olympic cycle within the period from 1993 to 2016 including (Tunnenmann, 2016, Latyshev, M. 2017). If to sum up all the performances of all the sportsmen for each year of the Olympic cycle, then it happens that in the first year of the cycle the quantity of performances (of all the sportsmen) makes 119, in the second year – 152, in the third year – 213, and in the fourth, that is in the year of the Olympic Games, – only 207. This confirms the general fact of the increase in the competitive practice every year up to the year of the Olympic Games when the quantity of the performances does not increase. The sportsmen tend to approach the Olympic Games in their best (optimal) athletic shape.

The next part of the paper is dedicated to the performance analysis of the sportsmen depending on the age (Figure 1). The quantity of the performances is summed up among all the sportsmen regardless of the rank of the international competitions and the taken place. One point has been added for each competition. A vertical dashed line denotes the average age of all the Olympic champions.

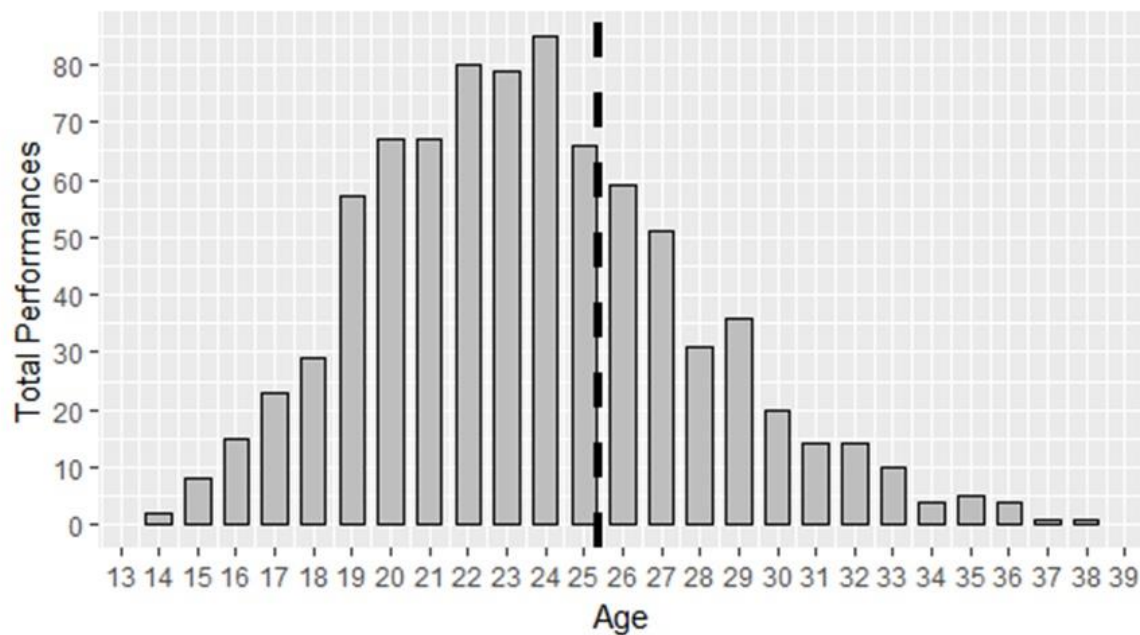


Figure 1. The allocation of the quantity of the performances depending on the age of the sportsmen

The average age of the winner of the Olympic Games equals to $25,5 \pm 3,7$ years. The achievement of the peak of the career in wrestling, according to the sources of literature, falls within 24 and 27 years (Boompa, 1999). The analysis of the age of the Greco-Roman style wrestlers (Baic 2014), who have won their first title of the European championship in the period from 2002 to 2012, has demonstrated that it equals to 24,9 years and it also has a tendency to the reduction of the time. At the same time the age of the Olympic champions and the world champions (Karninčić, 2017) in the period from 2002 to 2015 equals to 25,6. This data almost coincides with the results of the Olympic champions, therefore, the peak of the sportsmen's career falls on the stated age, however the peaks that they can reach depend on many factors, and mainly the level of athletes' development.

The given bar chart (Figure 2) characterizes the law of distribution of the performance quantity according to the age of the sportsman and creates a picture of the sporting career of the Olympic champions in general. The bar chart shows that the sportsmen start their international career at an early age and participate in pre-junior (up to 18 years) and junior (up to 21 years) competitions. The surge in the activity can be seen in 19 years and stays up to 27 years. The maximum activity falls on the age 22-24 years while the victory at the Olympic Games can be seen at the decline of the activity, that characterizes the cooperation of the experience acquired by this time and the necessity to save the organism resources. The next sharp decline in the activity takes place after 29 years and is followed by a gradual quantity reduction of the sporting performances.

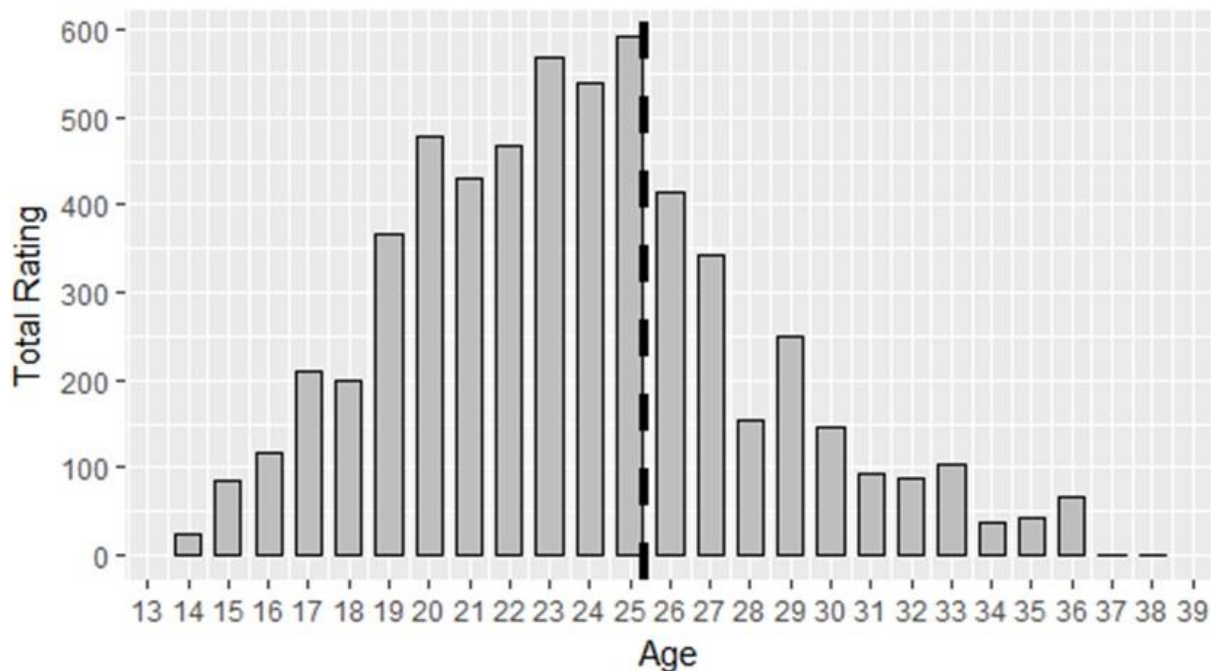


Figure 2. Allocation of the total rating of the wrestlers by the age

On the basis of the analysis of the bar chart it is possible to divide the whole sporting career on four important age periods: the pre-junior age (up to 18 years), junior age (up to 21 years), senior until the victory at the Olympic Games and a time period after the victory.

Let us consider the time interval until the start of the senior career – cadets and juniors. The statistical calculations show that the international career of the future champions has begun on the average at the age of 18,4 years. The minimum age equals to 14,2 years (Brandon Slay), and the latest age of the start of the international career is 25,0 years (Thomas Brands). During this period 35 (85,4 %) out of 41 wrestlers have participated in the continental or the world championship; 32 (91,4 %) wrestlers have taken the winning places. Twenty (48,8 %) wrestlers have started their international career before they turned 18 years (18 (90,0 %) of them have taken the winning places).

The given age period has an essentially significant importance for the forecasting and the selection, that is why the biographies of the 6 wrestlers, who have not taken part in the international competitions until the adulthood, are considered separately. Two sportsmen are representatives of the United States of America and they have performed very actively at the national championships and the professional competitions among universities. They have been leaders in their championships during a long period of time and,

presumably, have not been interested in the performances at the international competitions until a certain age. The sportsman, representative of Canada, is an emigrant. He has participated in the championship in Africa before reaching senior age; however these results have not been in the data base of the International Federation. Two Russian sportsmen have started their international career in 22 years and have immediately taken the winning places at the continental and the world levels. Probably, it is connected to the high competition in the domestic championships. The Georgian wrestler has started his international performances in 22 years, too, and only by the age of 26 he has become the winner of the continental championships for the first time. The reasons for such late international start are possibly connected to the late beginning of the wrestling trainings (at the age of 16). More data on the sporting biographies of the wrestlers is not available to the public.

It is important to underline that 26 (63,4 %) wrestlers being in the junior age (18-20 years) have already taken part in the senior competitions, almost all of them (24 out of 26 wrestlers) have participated in the continental or the world championships. The importance of such performances of the juniors is demonstrated in the researches of Li (2018): 90,4 % of such sportsmen achieve results at the time of the international senior career.

During the whole period of the adult career almost all of them, namely 39 (95,1 %) wrestlers, have taken part at the continental championships. It is worth stressing that 34 (87,2 %) sportsmen out of them have been the winners of the given championships, and the rest have taken the winning places. Thirty-six (87, 8%) sportsmen have participated at the world championships, 26 (72,2 %) of them have become the winners, and 34 (94,4 %) have taken the places not lower than the third.

The period of the senior wrestling prior to the victory at the Olympic Games is more important for the forecasting of the sporting performance and the formation of the sporting career. Let us consider the performances of the sportsmen in the given period. The period prior to the first victory is chosen for the sportsmen who have won the OG a couple of times. Table 2 demonstrates the data of the performances of the OG winners prior to their victory at the OG. The activity has lowered notably in the period after the victory at the Olympic Games, especially it is noticeable for the continental competitions.

Table 2. The results of the Olympic Champions prior to winning their Gold Olympic Medals

Competition Level	Time Period to Prior or After Winning Their Gold Medals	Quantity			Average Quantity of Performances *
		Participants. % *	1 place. % **	1-3 place. % **	
Continental Championships	Prior	36 (87.8 %)	29 (80.6 %)	36 (100.0 %)	2.85
	After	19 (46.3 %)	16 (84.2 %)	18 (94.7 %)	0.98
World Championships	Prior	34 (82.9 %)	21 (61.8 %)	31 (91.2 %)	2.24
	After	23 (56.1 %)	11 (47.8 %)	17 (73.9 %)	1.54

Note: * - of the overall quantity of the OG winners; ** - of the quantity of the participants of these competitions.

The results at all the levels of the competitions have also decreased. The quality of the performances at the continental competitions has lowered insignificantly, while at the world level it has lowered appreciably enough. This data proves the fact that the competition at the world stage is quite high and it is difficult for the wrestlers to hold their positions.

Figure 2 presents the allocation of the quantity of the gained rating points depending on the age. The points for each competition have been added according to the rating (Table 1).

The analysis of bar chart demonstrates the similar tendencies to the results of the analysis of the performances activity (Figure 1). Nevertheless, there are several significant differences. At the age of 17 the rating is higher than at the age of 18, as well as at the age of 20 it is higher than at the age of 21. It points to the particularity and importance of the mentioned ages for the appearance of more successful performances at the international level. We underline that the data of the age of 17 and 20 years is the last in the cadets and junior age groups respectively that conditions the capability to achieve higher results. The sportsmen show the highest rating at the age from 23 to 25 years, and the maximum of the activity fall within 22 – 24 years that is also connected to gaining the performance experience. At the age 26 – 27 years the sportsmen continue to perform at the high enough level after which there is a sharp decline in the performance. At the age of 29 the high results are determined by the successful performances of some sportsmen at the Olympic Games, that is either exception or a coincidence, but not a tendency. And it is worth noticing that at the age older than 36 years there are no successful performances at the continental or the world championships, though a certain low activity of the performance can be observed.

CONCLUSIONS

The majority of the sportsmen (90,3 %) win only once and participate in the OG only once or twice (90,2 %), that is why it is of paramount importance to approach the Olympic Games in the optimal preparedness. The retrospective analysis has shown that the international performances begin at the early age. 48,8 % of wrestlers-champions have performed at the international stage at the cadets age, and 85,4 % of sportsmen at the junior age, over 90 % of them have taken the winning places. Furthermore, more than a half of all the wrestlers (63,4 %) have participated in the international seniors competitions while being juniors. Prior to the victory at the Olympic Games 87,8 % of the sportsmen take part at the continental championships, all of them have won medals. And 82,9 % have participated at the world championships, and 91,2 % of them have taken places from 1 to 3.

The obtained data can be used for: identifying the main tendencies and regularities specific for each stage of the athletic performance; choosing informative predictive indicators and developing a model of a successful wrestler.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

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